

15. (New) The process according to claim 11, wherein said nucleated polymer is blended with 0.01 - 5 parts by weight of a coloring pigment selected from the group consisting of white pigments, green pigments, red pigments, blue pigments and carbon black, to provide a colored polypropylene composition, the shrinkage of which varies less than 5% for different color pigments, said shrinkage being calculated by comparing the measured dimension of an injection moulded box with the nominal mould dimension.

REMARKS

Applicants have amended the claims to correct improper dependencies, and various informalities. The amendments made to claim 8 can find support in the Specification on page 5, lines 1-3, while the amendments made to claim 10 find support on page 5, lines 11-13. No new matter has been added.

1. Claim Objections

1.1 The Examiner has objected to claim 5 as being in improper dependant form and for the recitation of the species "vinyl norbornane." The Examiner contends that vinyl norbornane does not satisfy the description of the vinyl compound of claim 4. Applicants respectfully disagree.

1.2 Claim 4 indicates that the R_1 and R_2 together form a five or six-membered saturated or unsaturated or aromatic ring, or if they stand independently for a lower alkyl comprising one to four carbon atoms. Vinyl norbornane is encompassed by the language of this claim. It contains a six-membered ring having, however, a bridge-forming carbon between carbons 1 and 4 of the ring. So there are seven carbons in all, six of them form the ring and the seventh acts as a bridge between two of the ring carbons. In view of this, applicants respectfully request reconsideration and removal of the rejection.

1.3 The Examiner has objected to claim 6, indicating that the term "copolymer" is a typographical error. Applicants have deleted this term, thereby overcoming the objection.

1.4 The Examiner has objected to claims 8, 9 and 11 indicating that the preamble to all recited Markush groups should read "from the group consisting of." Applicants have made the appropriate corrections, thereby obviating the objection.

2. Rejections Under 35 U.S.C. § 112, second paragraph

2.1 The Examiner has rejected claim 5 as being indefinite for recitation of the phrase "in particular." Applicants have amended the claim, deleting this phrase, thereby obviating the rejection.

2.2 The Examiner has rejected claim 7 as indefinite for recitation of the limitation "nucleated propylene polymer." The Examiner contends that there is insufficient antecedent basis for this limitation in the claim.

Applicants have amended claim 7, deleting the phrase "nucleated propylene polymer" and replacing it with "polymer nucleated with a polymerized vinyl compound." Support for this amendment can be found in the Specification on page 3, line 31 to page 4, line 1. Thus, Applicants respectfully request reconsideration and removal of the rejection.

2.3 The Examiner has rejected claim 8 as indefinite for recitation of the colors "yellow/orange," "red/violet," and "blue/green." The Examiner contends that the color and degree of coloration is vague because the term does not differentiate between a yellow-orange pigment and an orange-yellow pigment, for example. Applicants respectfully traverse.

Applicants have amended the claim to read, for example, "ranging from yellow to orange." Support for this amendment can be found in the Specification on page 5, lines 1-4. Here, the Specification provides examples that fall into the group of yellow/orange pigments, such as isoindolinone or azocondensation. This section of the Specification also indicates that the amount of pigment can vary. Thus, it is apparent that the color that would be produced from using a

lesser amount of pigment would be lighter than the color accomplished through use of a greater amount of pigment. One skilled in the art would immediately interpret this to mean that there would be a range of colors obtained from using pigments within the yellow/orange spectrum. Thus, Applicants respectfully request reconsideration and removal of the rejection.

- 2.4 The Examiner has rejected claim 11 for recitation of the limitation "nucleated polypropylene polymer composition" contending that there is insufficient antecedent basis for this limitation in the claim.

Applicants have amended claim 10 to introduce the phrase "nucleated polypropylene composition" into it. Thus, claim 11 now has sufficient antecedent basis for recitation of the limitation. The rejection is thereby overcome.

- 2.5 The Examiner has rejected claims 12 and 13 for not setting forth any steps involved in the method/process. Applicants have amended these claims, indicating in claim 12 that the method comprises subjecting the polymer compound to injection molding or compression molding, etc. to obtain the polymer articles. Thus, Applicants respectfully request reconsideration and removal of the rejection.

3. Rejections Under 35 U.S.C. § 101

The Examiner has rejected claims 12 and 13 for an improper definition of a process. Applicants have amended claims 12 and 13 so that they clearly recite positive steps in the process, thereby overcoming the rejection.

4. Rejections Under 35 U.S.C. § 103

4.1 The Examiner has rejected claims 1-13 as being obvious over US Patent 5,684,099 (Watanabe et al.). The Examiner contends that Watanabe teaches the incorporation of nucleating agents to impart rigidity, heat resistance and impact strength to polypropylene polymers. The nucleating agents, such as polyvinylcyclohexane and polyvinylcyclopentane, are used in amounts 0.05-0.5 wt.%. This reference also discloses additives such as coloring agents in amounts of 0.01-1 wt.%. The Examiner notes that while the examples do not contain a single embodiment that encompasses all of the claims of the instant application, the skilled artisan would have arrived at the present application because of the generic disclosure of Watanabe. The Examiner indicates that the reference does not particularly point out the physicochemical properties that are recited in instant claims 1, 3, 10 and 11, but that the prior art compositions would exhibit the same properties in

The present invention relates to the shrinkage and dimensional variations of colored products. That is, some pigments have a greater nucleating affect on polypropylene than others and these differences in nucleating affects result in inconsistent shrinkage and/or dimensional variation. This is problematic when the same product is to be prepared in different colors. The instant invention has determined that in order to obtain colored polymer compositions that have low shrinkage (i.e. good dimensional stability) it is essential that a strong nucleation is achieved, which dominates over the nucleation affect of the pigment leading to dimensional stability. A strong nucleation results in a significantly higher crystallization temperature of the material as compared to the corresponding non-nucleated polymer material. According to claim 1 of the invention, colored propylene polymer compositions with the desired low shrinkage, etc. properties can be obtained by using a composition comprising propylene polymer nucleated with a polymerized vinyl compound and having a crystallization temperature which is at least 7°C higher than that of the corresponding non-nucleated polymer and a color pigment in an amount of 0.0125 wt.%. Watanabe et al. teach propylene block polymer compositions that have increased rigidity, impact resistance, heat resistance and surface hardness. Watanabe does not, however, speak about the

increased rigidity, impact resistance, heat resistance and surface hardness. Watanabe does not, however, speaking about the low shrinkage and improved dimensional stability that is a hallmark of the instant invention. In addition, it does not disclose the importance of a high crystallization temperature of the polymer. The teachings of Watanabe would not lead a skilled artisan to use the specific composition disclosed in claim 1 of the instant invention in order to get propylene polymer compositions having the desire properties of low shrinkage and improved dimensional stability. Thus, Applicants respectfully request reconsideration and removal of the rejection.

- 4.2 The Examiner has rejected claims 1-13 as obvious over US Patent 4,551,501 to Shiga et al. in view of Watanabe. The Examiner contends that Shiga et al. disclose a polymer composition comprising a blend of crystalline polypropylene and 0.05-10,000 ppm by weight of a vinyl cycloalkane. While the inventors contemplate the use of additives such as carbon black and pigments, a specific amount of pigment is not disclosed in any example. The Examiner contends that one skilled in the art would turn to Watanabe to fill the deficiencies of the Shiga et al. reference in order to arrive at the instant invention. Applicants respectfully traverse.

4.3 Shiga discloses the use of a polymer of a vinylcycloalkane as a nucleating agent in order to improve the transparency and rigidity of the products, such as films and sheets. It does not speak to achieving dimensional stability.

4.4 Applicants respectfully submit that the Examiner is using hind sight to find the instant invention obvious over Watanabe or Shiga, or a combination of the two. These references, either alone or in combination, do not even suggest that low shrinkage and improved dimensional stability can be achieved when intense nucleating events occur. To say that Watanabe may allow for some combinations to be made that may produce the composition of the instant invention is not sufficient. This would be akin to an "obvious to try" standard, which is improper. As a consequence, Applicants respectfully request reconsideration and removal of the rejection.

In view of the above remarks, all of the claims remaining in the case are submitted as defining non-obvious, patentable subject matter.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), the Applicant respectfully petitions for a one (1) month extension of time for filing a response in connection with the present application and the required fee of \$110.00 is attached hereto.

Mesa, CA at 714-708-8555, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

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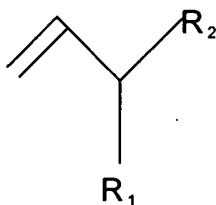
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been amended as follows:

5. (Amended) The polymer composition according to claim 4, wherein the propylene polymer contains units derived from cycloalkane[, in particular vinyl cyclohexane, vinyl cyclopentane, vinyl-2-methyl cyclohexane and vinyl norbornane,] 3-methyl-1-butene, styrene, p-methyl-styrene, [or] 3-ethyl-hexane units or mixtures thereof.
6. (Twice Amended) The polymer composition according to claim 1, wherein the [nucleated propylene] polymer nucleated with a polymerized vinyl compound comprises a propylene polymer [copolymer] polymerized in the presence of a catalyst modified with a polymer containing vinyl compound units.
7. (Twice Amended) The polymer composition according to claim 1, wherein the [nucleated propylene polymer] polymer nucleated with a polymerized vinyl compound comprises a propylene homo- or copolymer blended with a polymer containing polymeri[s]ized vinyl compound units.
8. (Twice Amended) The polymer composition according to claim 1, wherein the pigment is selected from the group consisting of white pigments, [yellow/orange] pigments ranging from yellow to orange, [red/violet] pigments ranging from red to violet, [blue/green] pigments ranging from blue to green and carbon black.

9. (Amended) The polymer composition according to claim 8, wherein the pigment is selected from the group consisting of titanium dioxide, isoindolinone, azocondensation, quinacridone, diketo pyrrolo pyrol, ultramarine blue, Cu Phtalocyanine blue and carbon black.
10. (Amended) A method [process] for preparing a colo[u]red polymer composition comprising [a propylene polymer and colour pigment, characterized by using a] blending a nucleated polymer composition comprising propylene polymer nucleated with a polymerized vinyl compound and having an at least 7°C higher crystallization temperature than the corresponding non-nucleated polymer, with a coloring pigment, wherein the concentration of [the] said colo[u]ring pigment [being] is 0.01 to 5 wt % calculated from the weight of [the] said nucleated [propylene] polymer.
11. (Amended) The process according to claim 10 wherein 100 parts by weight of [a] said nucleated polypropylene composition contains[ing] about 0.0001 to 1% by weight of units derived from a vinyl compound of the formula



wherein R₁ and R₂ together form a 5 or 6 membered saturated or unsaturated or aromatic ring or they stand independently for a lower alkyl comprising 1 to 4 carbon atoms [is blended with 0.1 to 5 parts by weight of a colouring pigment selected from the group of white pigments, green pigments, red pigments,

blue pigments and carbon black, to provide a coloured polypropylene composition, the shrinkage of which varies less than 5% for different colour pigments, said shrinkage being calculated by comparing the measured dimension of an injection moulded box with the nominal mould dimension].

12. (Twice Amended) [Use of a polymer composition according to claim 1] A method for the manufacture of polymer articles [by] comprising subjecting the polymer compound according to claim 1 to injection moulding or compression moulding, thermoforming, blow moulding, film or sheet extrusion, or pipe or cable extrusion to obtain polymer articles.
13. (Twice Amended) [The use of] A method according to claim 12, wherein said polymer articles are caps or closures for food, household, hygiene or health-care applications [are manufactured].